

Space News Roundup

Vol. 27 No. 11

May 20, 1988

National Aeronautics and Space Administration

Fletcher sounds alarm on proposed cuts

The civil space program will be "stopped in its tracks" if Congress approves a fiscal 1989 NASA budget level now being considered by the House of Representatives, NASA Administrator James C. Fletcher warned a recent science education symposium.

"Lack of adequate funding for NASA will literally paralyze the program and bring to a halt the 30 years of progress that began after the shock of Sputnik in 1957," he said.

Fletcher, who has said repeatedly that this is a "make or break"

budget year for NASA, issued his toughest warning yet about the consequences of reducing the NASA funding levels proposed by the Reagan Administration at a May 7 symposium on "Science Education: A Challenge for Excellence in America's Future." It was held at the Hart Senate Office Building in Washington, D.C., and was sponsored by the Smithsonian Institution and the Achievement Awards for College Scientists Foundation.

"The fact is that the American civil space program—your space program—and the source of so

much American pride, prestige, and scientific and technological progress, faces a crisis unparalleled in its lifetime," he said. "We will fall even farther behind at a time when the Soviet Union, Japan and our European allies are moving steadily ahead."

"It is not a pretty prospect to imagine the United States as a second-rate, or even a third-rate power in space. But that is what this country will quickly become if Congress doesn't act responsibly and give NASA the resources it needs to do its job," Fletcher said.

In February, the White House requested \$11.48 billion for NASA in fiscal year 1989. The proposed funding level would give NASA the resources needed to carry forward ongoing programs in space and aeronautics, including returning the Space Shuttle to flight on a sensible flight rate. It also would support the first steps of the President's new National Space Policy, which commits the United States to space leadership as a national objective and, for the first time, sets the long-range goal of expanding human presence beyond Earth

orbit into the solar system.

Subsequently, the House of Representatives passed a fiscal 1989 budget resolution that would slash NASA's budget request to \$10.2 billion. The Senate approved a budget resolution with overall NASA funding levels much closer to the Administration's request. Conferees from both Houses are meeting to resolve the differences. Congress also must act on the authorizing legislation and the actual appropriations.

Following announcement of his
(Continued on page 2)



JSC Photo by Jack Jacob

John Box, Customer Service Center engineer, rumbles through JSC on his high-mileage roller skates.

Engineer is 'animal' on skates

By James Hartsfield

Roller skating is literally a way of life for Customer Service Center engineer John Box, and, for him, a 168-mile trip to Austin on his four-wheeled passions just wasn't as crazy as it sounds.

Box, a member of a loose knit group of downtown Houston skaters called "The Urban Animals," set a new personal distance record when he skated the cross-country trek from Houston to the state capital in early April. He was the only roller skater among an estimated 4,000 bicyclists who undertook the course as a benefit for the Multiple-Sclerosis Society.

The trip took Box 23 hours of

skating stretched over two days. Hills, a strong wind and a rough road made it a grueling ordeal. But Box, who has logged thousands of miles, is simply addicted to roller skating.

Why? "Mainly, just because it's fun—with a capital F and two n's," Box said. "And it's a great form of exercise. I used to jog, but it starts wearing away at your knees and your back. It's better for my bones, and it's more utilitarian. I'm able to use it for transportation or just sightseeing, as in the case of Austin."

For Box, skating down a certain street is akin to the challenge climbers feel when they scale a

mountain. He keeps a map of the streets he's skated in his apartment. "I've gotten most of downtown Houston," he said.

And JSC hasn't escaped his wheels. "I came out once on a weekend and skated it, just to do it," Box said. Before coming to JSC in June 1987 from Marshall Space Flight Center, his native Huntsville, Ala., was the target of his relentless skates.

"I think I was the only person in the whole county there with a pair of skates," he said. But that's not so in Houston. The Urban Animals number in the hundreds, he said, and many of them and
(Continued on page 2)

Barrier O-rings stop hot gas in solid rocket test

The redesigned Space Shuttle solid rocket motor performed well in a pivotal April 20 full-duration firing test of Qualification Motor-6 (QM-6), according to program officials, and preparations have begun for the next test firing in June.

Intentional flaws in the center field joint and the case-to-nozzle joint insulation bonding allowed hot gas to reach barrier O-rings, but in both cases the barriers prevented hot gas from reaching either the primary or secondary O-rings, said Royce Mitchell, solid rocket motor (SRM) project manager at Marshall Space Flight Center. The QM-6 test also successfully resumed use of an outer boot ring design tested on Development Motor-8.

"All indications are that it was an excellent test, and we're very pleased with the results," Mitchell said at a May 10 briefing. "This was a very critical and pivotal test for the solid rocket motor program."

The QM-6 motor was completely disassembled and inspected following the two-minute firing at Morton Thiokol's Wasatch Facility in Utah.

Mitchell said the flaw in the insulation J-seal, which closes and protects the center field joint from the internal flame front, was a

manufacturing-type "wave defect" designed to allow hot gas into the joint area. Inspection showed hot gas flowed through the flawed J-seal over two-thirds of the motor circumference, charring insulation and reaching the capture feature O-ring in four places.

The test verified the integrity and sealability of that O-ring even though it was not designed as a seal,

Mitchell said. "There was absolutely no degradation whatsoever."

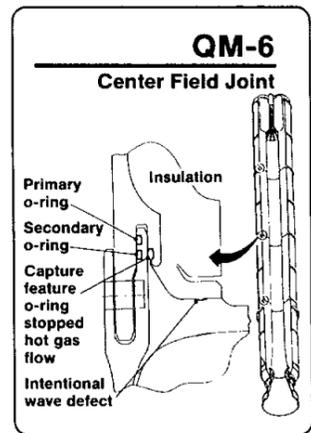
Rod Lofton, JSC's Level 2 SRM project integration engineer, said the unexpected penetration of hot gas to the capture feature O-ring was not a problem.

"That was the whole purpose of this design," Lofton said. "It was unexpected that the wave defect in the insulation didn't

seal, but the design did prove out in that it prevented hot gas flow to the primary and secondary O-rings."

In the case-to-nozzle joint, a greased shoe string was used to create a gap that would compromise the integrity of the polysulfide adhesive joint between two sections of insulation, Mitchell said. The gap led from the wiper O-ring barrier through the adhesive to the flame front. Hot gas got through adhesive just ahead of the wiper O-ring, but the ring remained unscathed, he said.

(Continued on page 2)



Astronaut selection cycle changes

Candidates to be evaluated every two years

Astronaut candidate selections will be conducted on a two-year cycle beginning with the next class of candidates in 1990, NASA announced May 11.

In the past, astronauts were chosen as needed with selections in 1978, '80, '84, '85 and '87.

The two-year process will moderate the demand on NASA resources required for candidate selection and training, while maintaining the manpower levels necessary to meet mission requirements.

"The selection process ties up a large number of fairly important people around the center," said

Duane Ross, manager of JSC's Astronaut Selection Office. "This way, we'll save time in intervening years."

Ross said astronaut candidate selections may take a little more time every other year because more applicants will have to be looked at, but that the overall time savings will remain.

The next selection cycle will begin July 1, 1989, with the cutoff date for applications. Applications received after that will be eligible for consideration in the next cycle. Nominees will be submitted by the military services at the same time. After six

months of screening, medical evaluation, and interviews, selections will be announced in January 1990, and candidates will report to JSC in July 1990.

The selection process will begin again in July 1991 with the cutoff for applications to be considered in the 1992 selection. The number of selections will be based on projected requirements.

NASA will continue to accept and review applications from the general public on an ongoing basis.

Applications can be obtained by writing to the Astronaut Selection Office, Mail Code AHX.



Photo by Dale Martin

PICNIC PAINT—One of the many fashion conscious youngsters at the "Back to the Future" JSC Picnic shows off her illustrated face. The picnic was May 7 at the Gilruth Recreation Center.

People

Thoren gets excellence award

L. Diane Thoren recently received the Marilyn J. Bocking Secretarial Excellence Award for her outstanding work in the NSTS Avionics Systems Office. Thoren received a plaque and \$500 in cash for outstanding performance of her duties, including maintaining the calendar for the office manager and staff, prioritizing meetings and appointments, and maintaining office correspondence. Her work has excelled to the point that her office has repeatedly been requested to give briefings to other offices concerning organizational techniques.



Thoren

Bulletin Board

Bay Area PC group plans meeting May 24

The Bay Area PC Organization (BAPCO) will meet at 7:30 p.m. May 24 in the League City Bank and Trust building. BAPCO meets on the fourth Tuesday of each month at that location.

JSC Blood Drive to be held May 31

The second JSC Blood Drive of 1988 will be from 8 a.m.-noon and 1-4 p.m. May 31 in the Gilruth Recreation Center. For more information or an appointment, call Mary O'Rear, JSC Blood Bank co-chairman, at x36531.

Ada Language Binding meetings start May 31

The IEEE POSIX 1003.5 Ada Language Binding Subcommittee will meet May 31-June 2 at the Holiday Inn, NASA. Anyone who wants to take part should have a strong technical understanding of both UNIX and Ada. Registration will be at 8 a.m. May 31 in Conference Rm. 104 for a \$70 fee. Working meetings will be held each day and a general assembly is planned at 1 p.m. June 2. People who don't want to attend the working meetings but are interested in the progress of the subcommittee are urged to attend the assembly. For more information, call Jayne Baker at 335-8553.

UHCL foreign language classes begin June 6

The University of Houston-Clear Lake is offering non-credit classes in French, German and Russian to begin meeting June 6. Small group classes at all levels of proficiency will be held in the Bayou Building at the Regent's Park Training Facility. Classes will meet once a week for seven weeks, ending July 22. Tuition is \$92 for new students and \$89 for previous students. French and German for children also will be taught. For registration information, call 488-9315.

Retired federal employees to meet June 7

The National Association of Retired Federal Employees will have a dinner meeting at 6 p.m. June 7 in the Harris County Park Building, 5001 NASA Road 1. The Pua Mana Dancers will provide entertainment after dinner. For more information, call Burney Goodwin, 326-2494, or J.B. Fox, 333-4460.

Lunar base international perspective eyed June 9

The AIAA International Space Activities Committee will host a lunch and learning discussion of "Lunar Bases: An International Perspective," at 11:30 a.m. June 9 in the Bldg. 3 cafeteria. Dr. Wendell Mendell will be guest speaker. For more information, call Kyle Fairchild, x36630, or Carolyn Blacknall, 338-2682.

NASA night at the Astrodome set June 24

NASA night at the Astrodome June 24 will feature the Astros vs. the San Francisco Giants with tickets available to employees for \$7 each. A limited number of tickets will be available at Bldg. 11 beginning May 23; there is a limit of six tickets per employee. Seating will be at field level. For more information, call x35350.

Guadalupe River raft trips set June 18, July 16

The JSC-EAA is planning trips to raft down the Guadalupe River near New Braunfels on June 18 and July 16. Saturday or overnight packages are available for the June 18 trip, while Saturday trips only are offered July 16. A \$27 per person ticket for a day trip will cover bus transportation, a raft trip and a barbecue dinner. A \$69 per person overnight ticket for June 18 will cover the same bus transportation, raft trip and barbecue plus lodging at New Braunfels' Faust Hotel, a buffet breakfast and tube floating on the river on Sunday. Tickets for June 18 will be on sale through June 13, and tickets for July 16 will be on sale through July 11. All buses will leave JSC from the parking lot of Bldg. 25 at 9 a.m. For more information, call x35350.

Fall classes to focus on high-tech management

UHCL will offer two classes this fall that will focus on management in an advanced technology environment. "Decision Making in a High Tech Environment" and "Managing Large Systems" will both be taught on weekday evenings. The decision making class will focus on federal contracting processes and the relationships between research, development, engineering and manufacturing. The managing systems class will cover motivating professional employees, organization, systems integration and quality assurance. For more information, call 488-9533.

Gilruth Center News

Call x30304 for more information

EAA badges—Dependents and spouses may apply for photo ID badges between 6:30 and 8:30 p.m. May 24 and June 6.

Defensive driving—Class will be taught from 8 a.m.-5 p.m. June 18 and will cost \$20.

Weight safety—A required class for employees who wish to use the Rec Center weight room, it will be taught June 8 for a \$4 fee.

Softball tournament—Men's Open C tourney will be June 11-12. Entry fee is \$95; deadline for entries is June 8.

Physical fitness—Class will meet at 6:30 a.m. Mondays, Wednesdays and Fridays July 5 through Sept. 23.

Beginning tennis—Lessons will start June 6 and meet from 5:15 to 6:45 p.m. for six weeks. Cost is \$32.

Basketball officials—The recreation department will conduct a basketball officiating clinic to recruit new officials in the near future. For details, call x30317.

Scuba—Scuba classes begin July 11 and meet every Monday and Wednesday from 7 to 9 p.m. for six weeks. Initial fee is \$45 and \$80 will be due at the first class.

JSC inventors get honors for patents

JSC honored four inventors for the patents they received on three devices during 1987 at the second annual Inventors Award Luncheon on May 16.

Plaques inscribed with the first page of text from their respective patents were presented to William D. Harwell and Dale A. Gardner for a satellite retrieval "Stinger" device; to William R. Acres for a refined spacecraft docking latch; and to Olin L. Graham for an apparatus that can refine communications used in remote control.

Chief Astronaut Dan Brandenstein accepted the plaque for Gardner, a former astronaut who was unable to attend. The plaques were presented by Daniel Nebrig, executive assistant to JSC Director Aaron Cohen, who had planned to attend but was called to Washington.

"As a center, we are intimately involved in pushing back the frontiers of science and technology," Patent Counsel Ed Fein told the group. "And your contributions are what make it possible."

Director of Engineering Henry Pohl stressed the importance of creativity in a short address following the presentation. "This is what engineering's all about. I've been

in the business for 30 years, and 30 years ago I used to sit and think how far we had to go. Now, I look back at 30 years and see how far we've come," Pohl said. "It's the time spent dreaming about a better mousetrap that has payoffs for all of mankind."

Harwell and Gardner's apparatus and method for capturing an orbiting spacecraft, U.S. patent number 4,664,344, is a grappling device used in STS-51A to retrieve two satellites, Westar and Palapa, which were in useless orbits due to booster failures. Astronauts Gardner and Joe Allen each retrieved a satellite with the device, nicknamed the "Stinger." Westar and Palapa were returned to Earth aboard the Orbiter.

A satellite retrieving device is now on display at the Smithsonian Institution, Harwell said. The device took six months to develop and works in much the same manner as a spring-loaded toggle bolt, he added. Harwell is now a Space Station subsystems manager in the Crew and Thermal Systems Division.

Acres' preloadable vector sensitive latch, U.S. patent number 4,682,745, is a refinement of the docking mechanism used in the

Apollo-Soyuz mission. The latch's unique feature is that it will automatically release if pulled at an angle due to a problem with any other latches on the docking mechanism. The feature helps to assure the separation of coupled spacecraft, Acres explained. Acres is a section chief in the Structures and Mechanics Division.

Graham's method and apparatus for telemetry adaptive bandwidth compression, U.S. patent number 4,682,225, has uses in refining the remote control of mechanisms through improved communication. The device and method were in development off and on for six to eight years, Graham said. The 1987 patent is Graham's third. Graham is chief of the Television Systems Section in the Tracking and Communications Division.

A total of 12 patent applications were filed on inventions by JSC employees in 1987, and three patents have been issued to employees so far in 1988. Another seven patents have been allowed this year, a status close to issuance, Fein said. The 10 inventions that have been either patented or allowed were developed by 29 employees, an indication of a growing awards luncheon.



SAFE EATING—Charles Harlan, director of Safety, Reliability and Quality Assurance, left, dives into the pie-eating competition at the first annual SR&QA Aprilfest at the Gilruth Recreation Center. Giving him a run for his filling are Greg Baumer, center, Lee Graham, and Vance Brand, not pictured.

Proposed cuts could paralyze space program

Scientific research might be forfeited

(Continued from page 1)

new National Space Policy, the President "backed it with a budget request for NASA that would ensure that the space program recovers and begins to move out on the road to leadership in decades ahead. That budget is not extravagant. It merely allows NASA to do its job for now," Fletcher said.

"Budget levels being discussed right here on Capitol Hill, even as we meet, would spell death to the Space Station, the key to our future in space. Major commitments to our Space Station international partners would have to be abrogated. Advance astronomy observatories that are designed to be serviced from the Space Station will never get off the ground," he continued.

"Scientific research that could lead to new products and processes to benefit life on Earth will never take place. And the Shuttle program, on which so much attention is focused today, will be able to operate only at a reduced flight rate in the years ahead.

"The NASA budget, only less than 1 percent of the entire federal budget, is probably the best investment we can make as a nation," Fletcher said. "If we fail to make that investment, the fire and spirit will have gone from NASA and the civil space program will have come to a grinding halt."

Outer boot ring passes test

(Continued from page 1)

The ablative outer boot ring, which protects the flex bearing used to swivel the nozzle and steer the Shuttle, performed well even though it was subjected to angles that never would be expected in flight.

"One of our best-trained technicians said it was one of the best outer boot rings in the entire program," Mitchell said.

The next solid rocket motor test is QM-7, which is scheduled to be fired on Morton Thiokol's new test stand in June. Production Verification Motor-1 (PVM-1), scheduled for July on the same test stand used for QM-6, is to be the last test firing prior to STS-26. Those motors are expected to be flawed even more

in order to directly test the primary and secondary O-rings.

"We really want to challenge this design, challenge the redundancy features which we have not done due to the superb performance of the features upstream," Mitchell said. "So we will have to violate our capture feature O-ring and wiper O-ring as well as the insulation to demonstrate that our O-rings downstream perform properly."

Lofton said he is encouraged by the test results, and that he's reasonably certain the QM-6 configuration will be used on STS-26. Stacking of the STS-26 solid rocket motors which use the QM-6 design is under way at Kennedy Space Center.

Engineer is 'animal' on skates

(Continued from page 1)

other addicted street skaters work in JSC or the surrounding area.

"There are Urban Animals in places you wouldn't expect," he said. "For some families, it's a way of life: parents, kids — all Animals."

Houston piqued Box's interest in skating. While here on a business trip from Marshall in 1985, he befriended a group of downtown street skaters — and was hooked almost immediately.

He hadn't roller skated in 20 years prior to his Houston visit. "I had some clamp on things when I was a kid. But roller skates have really come a long way," he said. "I bought a pair of skates for \$170. I felt it was a better investment than a bike. Bikes get stolen. Who's going to steal a pair of size 13 skates?"

When Box returned to Huntsville, he began skating in earnest.

He completed an 85-mile skate from Athens, Ga., to Atlanta, Ga., twice. He once skated a loop around Dade City, Fla. But he kept in touch with his friends in Houston.

"The whole purpose of moving here was to get a job at JSC and to skate downtown," he said. He began his work at JSC in June 1987, and now both work and hobby are perfect for him.

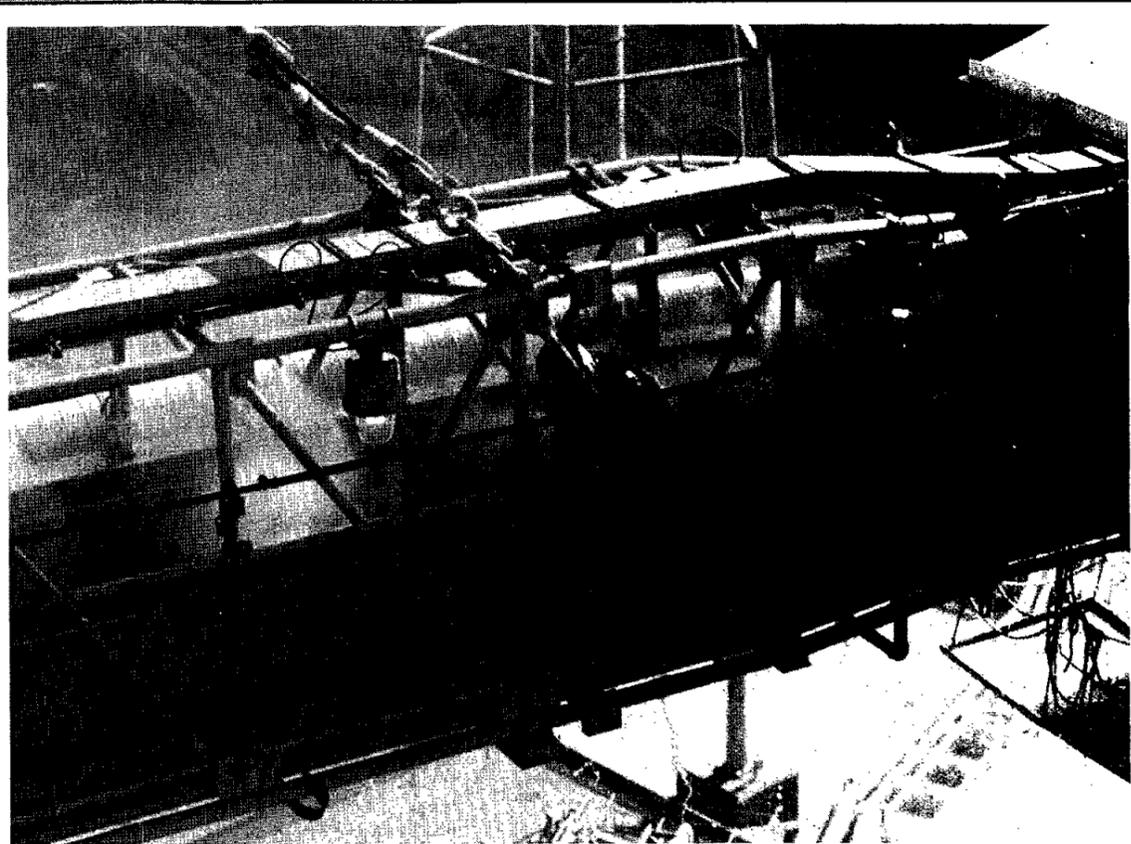
In his work at the Customer Service Center, Box helps supply customers with information they need to integrate their payloads into the Shuttle. "It's consistently the most fun thing I've ever been paid to do," he said.

While gearing up for his trip to Austin, Box skated at least five times a week. Now, usually every weekend, he trades tie and dress shoes for an Urban Animals' T-shirt and skates. And whenever he

skates, it's not just around a rink. "It's almost not worth putting on your skates if you're not going to go at least five or six miles," he said. Box has also skated competitively, and he recently finished a 25-mile "SCATE Houston" competition in 100 minutes.

The Urban Animals aren't a very close group, Box said. "They're just a group of people who like to skate downtown and who share the same ideas on how you should dress when you skate," he explained. "I'm not really sure how it caught on or why, but it's still going."

And so is Box. His goals are to skate across a state line and to skate the 85-mile Athens to Atlanta trip in under eight hours. He's going to skate for the rest of his life, he said. "I thought it was just a phase I was going through and it'd go away. But it hasn't."



EGRESS!

Astronauts help test launch pad evacuation plans

By Kelly Humphries

A Space Shuttle crew prepares for launch from Pad 39-B. Five crew members are in either the crew compartment or the "white room" waiting to enter the Orbiter; two are still on the Fixed Service Structure.

Smoke is spotted on the launch tower. An alarm sounds. There is fire in a Hydraulic Control Unit. The pad will have to be evacuated.

That was the situation May 4 when Astronauts Kathy Thornton, Frank Culbertson, Sam Gemar, Ken Cameron, Jay Apt, Pierre Thuot and David Low began a simulated emergency egress at Kennedy Space Center. They comprised the FEET (Flight Emergency Egress Test) crew.

It was the first of three simulations that week designed to familiarize the astronauts, the launch team, the fire and rescue team, the ice inspection team and the close-out crew with evacuation routes, emergency equipment and procedures during both prelaunch and landing at KSC.

"The objective was to verify that all the changes put in place since 51L are right, and work as expected, and are ready for STS-26," said Thornton, who headed up the JSC Astronaut Office contingent at all three sims. "I think we achieved that

with flying colors."

In the May 4 sim, the emergency scenario was announced as five of the crew members were in the white room, the environmental chamber that connects the access arm to the crew compartment hatch. Four of the simulated crew members were dressed in the new partial pressure suits that will be worn during launch and landing.

When the order to evacuate was given, the two crew members still on the Fixed Service Structure (FSS) returned to the elevator, put on their air supplies and headed for the slide-wire baskets. The rest ran back across the Orbiter Access Arm (OAA) through a deluge of water.

During their evacuation, test officials handed Commander Frank Culbertson a card stating that he had suffered a head injury. Mission Specialist Frank Gemar received a broken leg card. The close-out crew and fellow crew members helped the injured don their air supplies and get into slide-wire baskets.

The astronauts and close-out crew members then got out of the baskets and descended to ground level on the launch tower elevator. The baskets were loaded with sand bags and released, one by one, to slide safely to the ground. The crews then got back into the baskets to simulate unloading in the same order they would

have arrived had they actually slid down in the baskets.

After getting out of the baskets, crew members who were able ran to the nearby underground bunker, reported who was there and who wasn't. Rescue workers helped the injured crew members to the bunker.

The crew was helped into the M113 armored personnel carrier, which carried them to a triage site where helicopters were waiting to fly the injured to Jess Parrish Memorial Hospital five to 10 minutes away.

"I thought it all went very smoothly from the start to the end," Thornton said. "The slide wire baskets worked well. The bunker was a tremendous improvement over what we used to have. The handover from fire rescue to triage went smoother than any other test we've done."

Several modifications have been made to the emergency egress system to increase safety margins.

Fire-protection plating has been added to the access arm and the 195-foot level of the FSS. Additional fire detectors have been installed on the FSS, and the water spray system has been upgraded to better cover the egress paths. Lighting has been improved in case of a night emergency.

Two slide-wire baskets have been added to the FSS, making a total of seven

baskets. Baskets have been rated to hold three instead of four people. They have been modified to incorporate a side exit, add a flame-protective covering over the existing webbed material, and install an anti-roll-back brake to stop the basket more quickly. A rope arresting net at the end of the slide-wire provides a backup should the braking system fail.

A new underground, steel-reinforced concrete bunker with a foot-thick roof and 15-inch-thick walls has been built, and access to the bunker has been improved. The bunker contains emergency air, an emergency shower, a telephone and four fold-down bunks.

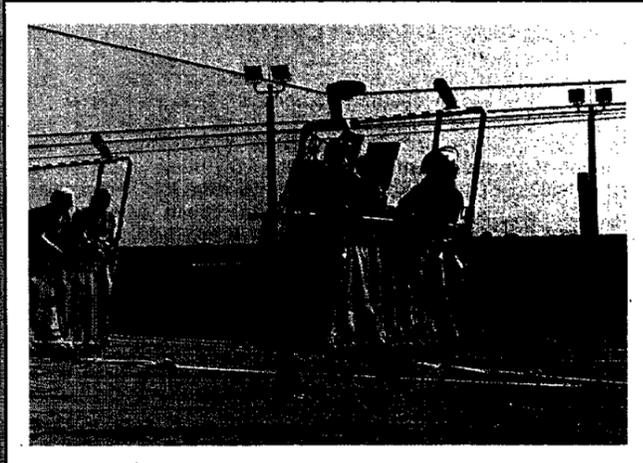
"We've got a few more things to review, but by and large we're finished and we can wrap it up now and get ready to go fly," Thornton said.

All three of the tests went smoothly, said Thornton, who has been working with the Emergency Escape and Rescue Group for about a year and a half.

"I think everybody on all of the teams is just interested in getting the job done," Thornton said.

The bottom line, of course, is how well the equipment and procedures work in a real emergency. How would she feel if she were really in that situation?

"I'd be confident that we'd get out safely."



Top left: Rescue crews wheel Astronaut Sam Gemar, feigning a broken leg, to the emergency bunker. **Top right:** an unidentified crew member dashes through a water deluge on the Orbiter Access Arm. **Left:** A flight crew member helps move an "injured" rescue worker to the new steel-reinforced concrete bunker. **Above:** test participants prepare to exit a slide-wire basket through a new side opening.

Photos by Mike Berg

Roundup Swap Shop

All Swap Shop ads must be submitted on a JSC Form 1452. The forms may be obtained from the Forms Office. Deadline for submitting ads is 5 p.m. the first Wednesday after the date of publication. Send ads to Roundup, AP3, or deliver them to the Newsroom, Bldg. 2 Annex, Room 147. No phone in ads will be taken.

Property & Rentals

Lease: 2-1, FPL, lake view, trees, park, boat ramp, avail. June 1, 1yr. lease, \$475/mo., \$300 dep. Dave, x33047 or 538-1441.

Rent: Jamaica Beach, marina house sleeps 8, central air, city water, \$50 per day (min. 2 days) plus \$20.00 service fees. 280-2493 or (713) 337-3970.

Sale/lease: Pasadena, 3-1-1, den, carpet, drapes appl., fenced, vinyl siding, \$395/mo. rent or \$31,900, assume 8 1/2 VA loan, \$14,400 equity, \$240/mo. 941-5908.

Lease: Clear Lake Forest, 4-2-5-2, FPL, central vacuum, \$1,100, 326-2636 or 488-4493.

Sale: '77 mobile home, 2-2, 14' x 65' central A/H, new carpet, \$7,500. Doug, x33399 or 480-2929.

Lease: Clear Lake City, 1 BR condo, fan, appl., W/D conn., low dep. Jim Briley, x30011 or 488-7901.

Lease: University Trace 1 BR, condo study, W/D, fans, pool, \$200 dep., \$375/mo. 282-4616 or 488-1454.

Sale: Sterling Knoll, 3-2-5-2, FPL, cathedral ceiling, mini-blinds, ceiling fan, microwave, garage dr. openers, \$63,000. x38594 or 486-4637.

Rent: West Galveston beach house, 2-2, marina/pool, \$500/wk, weekend rates avail. Fendell, x31206 or 538-1147.

Rent: Lake Livingston waterfront, 3-2 furnished, new cond. 482-1582.

Sale/lease: Clear Lake City 4-2-2, large yard, near school, pool. 282-3479 or 532-1112.

Sale: Kirkwood South, large custom 2-story, 4-2-5-2, FPL., both formals, family room, study, new 4-ton AC, \$79,900. Al, 488-5210.

Rent: Room in Friendswood home, unfurnished, male or female, includes util., W/D, microwave, cable TV. \$225/mo. Rowena, x31670 or 996-9249.

Lease: Galveston beach house in Pirates Beach, 3-2, W/D, all appl., \$600/wk. 488-0667.

Lease: Kirkmont subdivision, 3-2-2, school, new paint, carpet. 481-6158.

Lease: League City, Bayridge, 3-2-2A, fenced, cent. A/H, dep., ref. 488-1301.

Sale: Sagemont area, 2-story 4-2-5-2, FPL, both formals, large den, near schools. 484-3859.

Lease: University Green, 2-story townhome, 3-2-5-2, FPL, fenced. 480-5361.

Lease: Vacation condo on Galveston seawall, 2 BR, furn., tennis, exercise room, week of June 25 - July 2. Jim Briley, x30011 or 488-7901.

Sale: League City, 3-2-2, cul-de-sac, landscaped, low equity, FHA 10% fixed assumable. David, x35464.

Lease: Bacliff, mobile home lot, \$85/mo., \$50 dep. 488-1758.

Rent: Galveston Victorian Gulf-front condo, sleeps 6, furn., 2 pools, 3 whirlpools, 2 tennis courts. 480-5270.

Sale: Heritage Park, new section, 3-2-2, no equity or closing cost, assume 10% FHA W/O approval, \$790/mo. x31716 or 996-9762.

Lease: Egret Bay condo, 2-2-2, W/D, microwave, refrig., fans, FPL, pools, boat ramp \$425/mo. Lee 282-2412 or 480-4548.

Lease: Heritage Park/Friendswood, 3-2-2, FPL, fence, din. room, W/D, refrig., \$550/mo. 482-6609.

Sale/lease with option to buy, Oak Brook West/Clear Lake City, 4-2-5-2, formal dining, FPL, alarm system, custom drapes. \$795/mo. 482-6609.

Sale: 420 acres-1 mile outside Center, Tx., 300/timber, 120/pasture, half mineral rights. 482-4365 or (409) 254-3462.

Cars & Trucks

'85 Honda LX 4 dr. auto., full power, cruise, Michelins, low mileage, \$8,950 firm. x30092 or 481-3637.

'86 Jeep Commanche 4x4, P/S, P/B, 4 cyl., AC, AM/FM/cass., \$7,800 OBO. Greg, 482-5205 or 552-7425.

'80 VW Rabbit, diesel, 4 spd., AM/FM/cass., low miles, needs some work. 488-8080.

'67 Mustang, red, 3 spd., 289-V8, A/C, good tires, new exhaust system, 1 yr. warranty, good cond., \$2,995, OBO. Michael x38169 or 482-8496.

'77 Chevy Van, needs body & brake work, \$300. J. Craig x33977, 282-1911 or 420-2936.

'76 Dodge Maxi-window van, seats 15, AM/FM/cass./CB, 90K mi., A/C needs work. \$1950. Killingsworth x38396 or 488-1689.

'86 Cutlass Supreme, V-6, white/blue, landau top, loaded, \$7,950. x39374 or 481-3953.

'85 Ford Ranger P/U, red, 29K mi., 4 cyl., 5 spd., air, AM/FM, 19,000 miles left on transferrable warranty. \$5,200. 331-1014.

'85 Daytona Turbo Z, red on silver AC, full power, sunroof, cruise, tilt, AM/FM/Tape, \$6,995. 484-5927.

'83 S-10 Blazer, 4x4, good cond. \$5,000. Phil 471-1471 or 282-3497.

'80 Ford Mustang, silver & black, blue int., TRX suspension, 6 cyl., AC., runs well, \$2,000, OBO. Mike x37140.

'31 Yellow Alfa Romeo kit car/conv., 1966 VW Fastback type III running pan, 12 volt system. 486-7009.

'68 Porsche 911, rebuilt engine, new tires, \$5,600. 326-1278.

'71 Corvette, conv. (both tops), 95K mi., orig. owner, good cond., \$5,700. x39219.

'86 RX-7, sports model, white/maroon int., AM/FM/cass., ex. cond., \$11,995, OBO. Jeff x31470 or 996-7097.

'78 Dodge Motor home, 20', bathroom w/shower, stove, refrig., sleeps 4, good cond. 486-9760.

'76 Ford Mustang-II, white/red, 4 spd., 2300 cc., 94K mi., A/C, AM/FM, CB opt., \$750 OBO. 331-2693 or 282-3570.

'77 Ford LTD Brougham, 90K mi., engine, good cond. \$695, x31610.

'85 Buick Somerset, Limited Ed., all power, extras, blue, 2 dr., air, cass., cruise. 2.6 Liter, 4 cyl., 74K mi., \$5,400. Alan, x31497 or 532-2038.

'81 Ford Fairmont, auto., A/C, 6 cyl., silver/red, \$1,500. Greg, x34975.

'82 CJ5 red Renegade, 55,500 mi., straight 6 cyl., new soft roof, bikini, doors, tires, ex. cond. \$4500 OBO. Lee, 335-1668 or 332-2900.

'77 Ford Granada Ghia, 4 dr., 6 cyl., 4 spd., PS, A/C, AM/FM, 100K mi., good cond. orig. owner \$935. Allen, x35538 or 486-5740.

'84 Cadillac Fleetwood Broughman D'Elegance, mint cond., loaded, \$10,875. Tim, x32519 or 488-6227.

Volvo, 164E restored, new paint, new int., rebuilt eng., and trans., AC, AM/FM, \$1,900. Norris, x39027 or 488-2276.

'84 Ford Thunderbird Elan, 302 V-8, many extras, ex. cond., 55 K mi. x33239 or 485-1239.

'53 Buick Super, V-8, PS/PB, AC, good cond., auto. trans., \$1,200. Kent Lenington, x36466.

'77 Corvette, white ex. cond., \$7,000 nego. 487-7763.

'82 Corvette, silver/burgundy, loaded, \$10,800. 487-2383.

'79 Triumph Spitfire, conv., 79K mi., \$2,990. 331-3954.

'85 Ford 2 dr. EXP. H/B, 5 spd., AM/FM/cass., 54K mi., \$3,500. Larry, 282-3161 or 996-1013.

'81 Audi 5000S, Air/Heat auto., PS/PB, AM/FM/cass., low miles, all power, gray, x36688 or 471-4843.

'77 Honda Civic, needs help, \$400. 474-3181.

'87 Toyota Custom van, loaded, ex. cond., \$13,400. 474-3181.

'74 Mercedes 450 SEL, green, needs mech. work, \$5,900. Kinsey, x32271 or 486-0421.

'85 Mallard 35' motor home, loaded, low miles, \$37,000. 337-4051.

'80 Buick Regal, blue, AM/FM, int. ex. cond., some rust, 96K mi., \$1,000. Susan or Kay 331-3379.

'79 280ZX, brown, 5 spd. rem. sun roof, tinted windows, AM/FM/cass., A/C, new clutch, 70K mi., \$2,500. Kay, x34845 or 331-3379.

'79 Ford T-Bird, V-8, auto., A/C, PS, AM/FM/cass., new eng., ex. cond. Pete, x38572.

Cycles

'73 Yamaha XT-250, low mi., needs some work, \$100. 282-4042 or 482-7570.

'84 Honda Nighthawk 650, ex. cond., 1,400 mi., \$1,500. Currie, x35708 or 946-1923.

'82 Yamaha 550 Vision, black/gold pin stripe, shaft drive, cover, sport faring, 11K mi., \$975. Ron, 480-3424.

'83 Honda GL650 Silverwing, 4,900 mi., \$1,400, OBO. 335-8539 or 661-0273.

'79 Honda CX 500, good body, new tires, new battery, not running, helmet, wind jammer, luggage rack, \$200, OBO. 471-4843.

'82 Honda 110 3-wheeler, \$300 firm. 482-1602.

'80 Honda 750, custom, mags, always garaged, low miles, \$1,250. x30092 or 481-3637.

'78 Honda CX-500, 18,500 mi., \$500 OBO. Barbara, x38257 or 538-3675.

'79 Goldwing, 13,000 mi., fairing, trunk, saddle bags, \$1,100, OBO. 332-4303.

Boats & Planes

'79 Bayliner, 17' w/trailer, 120 Volvo Penta, I/O, \$4,200, OBO. 534-3280.

'78 Searay 195, 19', 302-V8, 190 hp running top, mooring cover, ex. cond., \$5,000. (713) 538-1515.

Lease: Floating boat slip, Portofino Harbour, avail. now, up to 40', 5 min. from bay. Ritz, x38501 or 780-2391.

Aitken 911 Sailboard, ex. cond., board only, \$250. Grady or Colleen, 480-3232.

15' Catamaran with galv. sportsman

trailer, new trampoline, ex. beginner's boat, \$1,000, OBO. Ed, x31927 or 554-6154.

26' Pearson sailboat, many extras, ex. cond., \$8,000, OBO. Tom, 332-7048.

Sears 15' canoe, paddles, life cushions, \$80. J.Kinsey, x32271 or 486-0421.

14' alum. Jon boat w/carpeted seats and bottom, galv. trailer, 15 hp Evinrude w/tank, Minnkota trolling motor w/battery, running lights, oar, \$1,000. Chris, x30794 or 941-0138.

18' Tri-hull fiberglass boat/w trailer, needs work, \$200. 85 hp Chrysler motor, \$300, KR2 kitplane, airframe 80% complete, \$1,200, OBO on all. 332-4303.

Prindle 18' Catamaran, like new, orig. owner, galv. trailer, sail & box storage, double traps, \$2,950 OBO. C.W., 282-1871 or 280-8796.

23' Sportcraft, 165 hp Mercruiser I/O, cuddy cabin, \$4,100. Bill, 280-1605 or 486-0581.

Household

Woodgrain breakfast table, 3 chairs, \$30; single size daybed w/cover \$15; small wood TV stand \$5; childrens bunk beds, \$50; bar stool type chair, \$3. 488-7113.

Baby furniture, Simmons crib and mattress, like new, \$250. 870-0990.

Sears Kenmore microwave oven, full size, temp. probe, op. manual, \$100. 486-4743.

Sears whirlpool bath, attach. kit, \$50; sofa and matching chair, flower print in earthtones, \$150. 332-1487.

Couch, beige, ex. cond., \$50. x36186 or 488-7646.

Sofa bed, good cond., beige floral pattern, Camel back-wide arm, \$175. 997-1440.

Dining table, laminated top, steel legs, center leaf, 4 arm chairs with casters, ex. cond., \$190 OBO. 484-3683.

25' console RCA colortrak TV, \$200; bedroom set, includes chest, dresser w/mirror & one night stand, \$100; 2 sets of new twin mattresses, \$125; rowing machine, \$40, OBO. Tammy, 282-4455.

Ortho Rest mattress and box springs (std. size), \$85. 996-9690.

90" couch, \$75; 1975 25" Heathkit color TV w/manual & troubleshooting kit, \$100; 48" wood swing, \$50; 6' oval rug, \$25; 10x15 wool Moroccan rug, \$50; bookcase \$10. Larry, 282-3161 or 996-1013.

Zenith 19" color TV with space phone, inoperable, \$19. Charles, 282-3012 or 486-6762.

Queen size bedroom set (6 pieces) 2 night stands, headboard, mattress, box spring and frame, \$400; new queen-size mattress and box springs, \$150. 481-8608.

Pair of cushioned matching straight chairs, \$17.50 both; TV stand, \$15; AM/FM/TIV radio, \$10; antique mantle clock (1879) Gilbert, \$175; antique foot stool, \$15; old wood highchair, ex. cond., \$45. 488-5564.

GE, single wall oven, 25 3/4" x 25 1/4", matching stove top 21 1/4" x 30", both ex. cond., \$65 ea. or \$100/pr. 941-5908.

Bunkbeds, ex. cond., sturdy oak-wood, mattresses incl., \$300. Billie, x38334 or 482-4365.

RCA portable video cassette recorder, \$200. 486-1110.

New set lgt. wt. copper bottom pots & pans, 11 pcs. never used, was \$130, now \$75. Mandy, 480-8190 or 480-2265.

Audiovisuals & Computers

IBM PC-XT, not a clone! Color graphics, 2 disk drives, enhanced keyboard, Panasonic printer 1092, power filter, DBASE III+, LOTUS 123, Wordstar 4.0, Autocad, Turbo Pascal, games incl., \$2,200. Huey x31695 or 748-2726.

AT&T 6300 Plus computer, 80286 processor, 512 K RAM, AT&T color monitor, 20 mega byte hard disk, 360 K drive, MS-DOS 3.1, one yr. old, \$1,950. Frank, x36221.

Apple IIe, 2 drives, 128 K, monitor, printer, \$750, OBO. Kent, 482-1562.

Vic 20 computer w/data cassette recorder & several cart., \$25; Sharp Monochrome Composite video monitor, \$35; Timex T1000 computer w/RAM cart, thermal printer \$15. Chris, x30794 or 941-0138.

Pioneer RG-2 dynamic processor, like new, \$25. John Greer, x30762 or 538-2327.

Leading Edge XT, 20 MHD. hi-res color monitor, EGA, microsoft mouse, Lotus 1-2-3, Pro-design, Word Perfect, \$1,995, OBO. John, x36484 or 486-1186.

Wanted

'63 Stingray Corvette hard top conv. Linda, x30307 or 326-2294.

Want baby bed mattress in good

cond. 482-1550.

Want lady to keep 1 - school age child and 2 pre-schoolers in my home and do housekeeping, Bacliff area. Lou Ann, x31777.

Want to trade \$10,000 electronic organ for land, truck or boat of equal value. 337-4051.

Would like to borrow a complete copy (VHS) of North & South. Mandy, 480-8190 or 480-2265.

Want to buy bicycle buggy in good shape. 996-6029.

Musical Instruments

Electric antique player piano with rolls, \$1,500; Kimball electric organ, double keyboard, bench, \$700; piano, \$400. 485-4995.

Ovation 12-string guitar, ex. cond., \$400; Ventura 5-string banjo, case, ex. cond., \$220. Ernie Smith x36893 or 485-2287.

Ludwig drum set with Zildjian cymbals, \$610. Charles, 282-3012 or 486-6762.

Kimball upright piano, \$250, OBO. Barbara, x38257 or 538-3675.

Photographic

Minolta XG-1 camera, Minolta MC Rokkor-X 45mm lens, Minolta auto 118X flash, MC auto zoom CPC phase 2 CCT Macro 75-200mm lens, carrying & travel cases, \$325, OBO. Jana, x31653 or 532-3008.

Albina camera access. bag, \$15. x30467 or 326-3092.

55mm lens for Canon AF-1 program camera, \$40, OBO. Walt, x35939.

Vivitar 285 strobe with rechargeable gel-cell battery. Pete, x38572.

Pets & Livestock

Free to good home. black female Manx cat, declawed/spayed, 2 yrs. old, current immunizations. Joe, x38851 or 944-7042.

2 yr. old AKC red male Cocker for stud, fee - pick of litter. M.C. Ball, 282-4686.

AKC female Golden Retriever, light colored, 2 years old, ex. watchdog, great with kids. 996-6029.

AKC registered cinnamon Chow Chow for stud, well tempered, BO; AKC registered Chow Chow puppies, (creams & cinnamons), will be six weeks old on 6/4. Beverly, x35714 or 488-3050.

Lost & Found

Lost: 25 year service pin, return to V. Booth, Mail Code NS5.

Miscellaneous

Sharp Carousel Browning microwave, \$200; Underwood 319 manual typewriter, \$45; 2 end tables, \$15 ea.; coffee table, \$35; Canon Typestar 5 Dot Matrix typewriter, \$60, OBO. 333-1955.

Crib \$50; car-seat \$5; carrier \$5; playpen \$10; pin-pong table \$25; men's Schwinn 10 spd. \$20; boy's BMX \$10; stroller \$5. 996-6029.

Custom 358 Norma Mag, Magna Port barrel, adjust. trigger, \$600 cash. 332-5057.

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NASA Lyndon B. Johnson Space Center

Space News Roundup

The Roundup is an official publication of the National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, Houston, Texas and is published every other Friday by the Public Affairs Office for all space center employees. Roundup deadline is the first Wednesday after publication.

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